

Abstract

An International Perspective on Maintaining Optimum Well Performance

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Operation of any ground water supply well requires constant monitoring and occasional rehabilitation in order to optimize long term performance and yield. Naturally occurring bioactivity and natural water chemistry in the well and surrounding aquifer is impacted by the operation of the well and the frequency of regular maintenance activities. Failure to carefully monitor well performance often results in declining yield and reduced well capacity.

The well rehabilitation technologies available for water supply wells in the Northwest include chemical, mechanical and impulse generation. Since ground water chemistry is a critical factor in the operation of most water supply systems, it is often the choice of well owners to avoid the use chemical rehabilitation technologies if possible. If chemical treatment is required, limit it to only those chemicals that minimize changes in water chemistry and are tailored to the specific biofouling problem. Recent university research on well rehabilitation technologies has provided additional understanding to which technologies are most effective.

In Germany, strict environmental laws related to ground water quality have resulted in the development and enhancement of non-chemical well rehabilitation technologies. The City of Berlin's water supply comes exclusively from 900 wells. The City has developed and maintained a very aggressive research and development program on well performance monitoring, operation, and maintenance over the past 50 years. Pigadi GmbH is a subsidiary company within Berliner Water Group, the former City of Berlin Water Bureau. They have developed a unique and successful approach to optimizing long term well performance.

Some of the most effective non-chemical rehabilitation technologies used to maintain the Berlin well system includes impulse generation devices in conjunction with other traditional mechanical methods. These technologies are similar to some used in the United States but with some significant differences and improvements based on the experience with the large Berlin well field. The key differences involve the careful documentation of long term performance to allow early identification of declining well yield and detailed rehabilitation processes designed specifically for each well. The application of the Berlin well field experience to northwest supply wells offers an excellent approach to optimizing long term performance of these systems.

Biosketch:

Jim Bailey is a senior water resources manager with Golder Associates Water Resources Group in Redmond Washington. Prior to Golder, he worked at HWA Geosciences where he managed the environmental group and was president of a subsidiary well services company jointly owned with a German company Berliner Wasser Betriebe (formerly the City of Berlin's water utility). Jim has more than 20 years of experience managing water resource and environmental projects related to water supply. Over the past several years his water resource work has focused on public and private water supply related well rehabilitation, inspection, testing and long term monitoring. He has also provided numerous technical training workshops on well monitoring and maintenance to public water system owners throughout the Northwest.